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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] About the lead-wire **** equipment used for example, for a starter motor, this invention relates to the lead-wire **** equipment of the motor which can prevent the leakage current flowing and can prevent expansion of accident, when unusual operation is carried out especially accidentally.

[0002]

[Description of the Prior Art] Drawing 4 and drawing 5 are the block diagrams showing the brush supporting structure currently indicated by JP,7-17255,Y and its brush equipment. In these drawings, 1 is 2a, the commutator of a motor and 2b are a brush by the side of plus, and a brush by the side of minus, respectively, these brushes 2a and 2b are held by the maintenance frame 3, and press energization is carried out in the commutator 1 direction with the brush spring 4, and the apical surface ****s to a commutator 1. 5 is the pig tail of brush 2a by the side of plus, and the terminal of the product [6] made from a metal plate. 7 is a grommet made of rubber, is attached in the machine frame of the starter motor which it is fitted in lead wire 10a and 10b, and is not illustrated, and performs waterproofing between lead wire 10a and 10b and a wooden flask, and protection against dust. 8 is the lead wire of brush 2b by the side of minus, and is connected to the substrate 9 made from the metal plate with which the maintenance frame 3 was attached.

[0003] Brush 2a by the side of plus is attached in the end of lead wire 10a and 10b, respectively. Moreover, the other end of both the lead wire 10a and 10b is connected to the terminal 6. 11 is the fixed part prepared in the pars intermedia of lead wire 10a and 10b, and lead wire 10a and 10b has fixed it to one by ultrasonic welding. In addition, this fixed part 11 is effective also as a mark for positioning when fitting a grommet 7 in lead wire 10a and 10b.

[0004]

[Problem(s) to be Solved by the Invention] With the above lead-wire **** equipments of the conventional motor To the lead wire 10a and 10b by which Brushes 2a and 2b were connected to the end, and the terminal 6 was connected to the other end Since a grommet 7 is fitted in and the grommet 7 is further attached in the commutator side bearing bracket as a machine frame of a starter motor, if a starter motor will be in a continuous duty state for a long time, for example by which malfunction with the poor return of the key switch of a vehicle The interior of the starter motor currently designed by short time rating may generate heat by continuous duty for a long time, and a part of coil circuit may connect too hastily. If a high current flows by this short pass, a grommet 7 will carbonize by generation of heat of lead wire 10a and 10b. Then, between lead wire 10a and 10b and the commutator side bearing bracket, the leakage current flowed, carbonization progressed further, finally the grommet 7 turned into the conductor, and the technical problem that a short circuit symptom will be presented occurred. That is, the so-called technical problem that a dead ground will be carried out occurred.

[0005] It prevents that this invention leads to a casualty by maintaining insulation even if a high current flows and generates heat to lead wire, when it is made in order to solve the above technical problems, and unusual operation is carried out accidentally, and aims at obtaining the lead-wire **** equipment of the motor which improved reliability.

[0006]

[Means for Solving the Problem] The lead-wire **** equipment of the motor concerning this invention is equipped with the insulating member which has been arranged between the lead wire by which the brush was connected to the end and the terminal was connected to the other end, the grommet which attaches this lead wire in the machine frame of a motor, and the aforementioned lead wire and the machine frame of a motor, and excelled the aforementioned grommet in thermal resistance.

[0007] Moreover, insulating member consists of silicon glass tubes arranged between lead wire and a grommet.

[0008] Moreover, insulating member consists of aramid papers arranged between a grommet and a machine frame. Moreover, insulating member consists of silicon glass adhesive tapes wound around lead wire.

[0009]

[Embodiments of the Invention]

Gestalt 1. drawing 1 of operation is the block diagram showing the gestalt 1 of implementation of this invention. In drawing 1, the portion which attached the same sign as drawing 4 and drawing 5 shows the same portion, and 14 is the silicon glass tube which excelled the grommet 7 made of rubber in thermal resistance. This silicon glass tube 14 is inserted in the portion which lead wire 10a and 10b and a commutator side bearing bracket 12 approach most between lead wire 10a and 10b and the grommet 7. The periphery of a fixed part 11 is covered with the gestalt 1 of this operation. In addition, what is necessary is just to let the silicon glass tube 14 pass beforehand, before attaching brush 2a in lead wire 10a and 10b, or before connecting

with a terminal 6.

[0010] Since the gestalt 1 of operation is constituted as mentioned above, by the prolonged continuous duty of the starter motor by which malfunction with the poor return of the key switch of a vehicle etc. Even if a part of interior coil of a motor short-circuits, a high current flows and a grommet 7 carbonizes by generation of heat of lead wire. Insulation is maintained with the silicon glass tube 14 which is a heat-resistant good insulating material between a grommet 7 and lead wire 10a and 10b, and the leakage current does not flow between lead wire 10a and 10b and a commutator side bearing bracket 12. That is, the leakage current circuit formed including lead wire 10a and 10b, a grommet 7, and a commutator side bearing bracket 12 is intercepted with the silicon glass tube 14. Therefore, carbonization of a grommet does not progress but carrying out a dead ground is prevented. That is, expansion of accident is prevented.

[0011] In addition, even if the silicone varnish ****(ed) to lead wire etc. decomposes with heat, since the tube of a glass fiber remains, a dead ground cannot carry out the silicon glass tube 14 easily. Therefore, it is effective also at the point that the effect of preventing a dead ground is strengthened.

[0012] Although two lead wire 10a and 10b has fixed what is shown in above-mentioned drawing 1 by the fixed part 11, two lead wire may be packed as they are, without fixing, and may be fitted in a grommet 7. Moreover, there is one lead wire and it may fit in a grommet 7 what connected the brush to the end and connected the terminal to the other end. Moreover, lead wire branches from the middle to two, connects a brush at each nose of cam, and it may connect it to a terminal 6 while making one fit in a grommet 7. In above-mentioned any [three] case, the same effect is done so by inserting the silicon glass tube 14 in the portion which lead wire and a commutator side bearing bracket 12 approach most between lead wire and a grommet 7 like what is shown in drawing 1. Moreover, when the edge of the silicon glass tube 14 is made to extend to the exterior of a grommet 7, much more effect is in carbonization prevention of a grommet. Moreover, although brush 2a is connected to the end of lead wire, the same effect is done so even if it connects with other motor inner conductors, for example, a field winding.

[0013] Gestalt 2. drawing 2 of operation is the block diagram showing the gestalt 2 of implementation of this invention. In drawing 2, the portion which attached the same sign as drawing 4 and drawing 5 shows the same portion, and 15 is the insulating member which bent aramid paper in the shape of a cross-section KO character. This insulating member 15 is inserted in the portion which lead wire 10a and 10b and a commutator side bearing bracket 12 approach most between the grommet 7 and the commutator side bearing bracket 12. That is, it is inserted so that the marginal perimeter of the hole for grommet attachment established in the commutator side bearing bracket 12 may be covered. In other words, the grommet 7 and the commutator side bearing bracket 12 have fitted in so that insulating member 15 may be inserted. In addition, generally as for the grommet 7, many chloroprene rubber is used, and the heat-resistant temperature is abbreviation 130degreeC. On the other hand, since the heat-resistant temperature of aramid paper is abbreviation 220degreeC, thermal resistance is superior to the grommet for the aramid paper.

[0014] Since the gestalt 2 of operation is constituted as mentioned above, by the prolonged continuous duty of the starter motor by which malfunction with the poor return of the key switch of a vehicle etc. Even if a part of interior coil of a motor short-circuits, a high current flows and a grommet 7 carbonizes by generation of heat of lead wire. Insulation is maintained in the aramid paper 15 which is the outstanding insulating material of the thermal resistance between a grommet 7 and a commutator side bearing bracket 12, and the leakage current does not flow between lead wire 10a and 10b and a commutator side bearing bracket 12. That is, the leakage current circuit formed including lead wire 10a and 10b, a grommet 7, and a commutator side bearing bracket 12 is intercepted in the aramid paper 15. Therefore, carbonization of a grommet does not progress but carrying out a dead ground is prevented. That is, expansion of accident is prevented.

[0015] In addition, the resistance at the time of an elevated temperature can say that aramid paper excels also in this point as a member for leakage current circuit interception since it is high. Therefore, expansion prevention of accident is made more certainly.

[0016] Although two lead wire 10a and 10b has fixed what is shown in above-mentioned drawing 2 by the fixed part 11, two lead wire may be packed as they are, without fixing, and may be fitted in a grommet 7. Moreover, there is one lead wire and it may fit in a grommet 7 what connected the brush to the end and connected the terminal to the other end. Furthermore, lead wire branches from the middle to two, connects a brush at each nose of cam, and it may connect it to a terminal 6 while making one fit in a grommet 7. In above-mentioned any [three] case, the same effect is done so by inserting the aramid paper 15 in the portion which lead wire and a commutator side bearing bracket 12 approach most between a grommet 7 and a commutator side bearing bracket 12 like what is shown in drawing 2. Moreover, when the edge of the aramid paper 15 is made to extend to the exterior of a grommet 7, much more effect is in carbonization prevention of a grommet. Moreover, although Brushes 2a and 2b are connected to the end of lead wire, the same effect is done so even if it connects with other inner conductors, for example, a field winding.

[0017] Gestalt 3. drawing 3 of operation is the block diagram showing the gestalt 3 of implementation of this invention. In drawing 3, the portion which attached the same sign as drawing 4 and drawing 5 shows the same portion, 17 is an interference terminal made from a copper plate, and 16 is the insulating member which wound the silicon glass-fabrics adhesive tape around the interference terminal 17. This insulating member 16 is wound around the portion which the interference terminal 17 and a commutator side bearing bracket 12 approach most. The interference terminal 17 is really fabricated by the grommet 7, where insulating member 16 is wound. In the weld zones 17a and 17b of the ends of the interference terminal 17, brush 2a and lead wire 18 are welded, respectively.

[0018] Since the gestalt 3 of operation is constituted as mentioned above, by the prolonged continuous duty of the starter

motor by which malfunction with the poor return of the key switch of a vehicle etc. Even if a part of interior coil of a motor short-circuits, a high current flows and a grommet 7 carbonizes by generation of heat of the interference terminal 17. Insulation is maintained by the silicon glass-fabrics adhesive tape 16 which is a heat-resistant good insulating material between a grommet 7 and the interference terminal 17, and the leakage current does not flow between the interference terminal 17 and a commutator side bearing bracket 12. That is, since it is really formed including the interference terminal 17, a grommet 7, and a commutator side bearing bracket 12, carbonization of a grommet does not progress, but a dead ground is not carried out and expansion of accident is prevented. In addition, since it is easy to twist around the interference terminal 17 and a binder is fixed, it is hard to move the silicon glass-fabrics adhesive tape 16 at the time of one fabrication of GUROMETSU 7, and it is effective in workability being good. Although what is shown in above-mentioned drawing 3 is using the copper plate for the interference terminal 17, it may be lead wire. Moreover, GUROMETSU 7 may fit in a grommet 7 the interference terminal 17 with which it did not the interference terminal 17 and really fabricate, but ** also twisted the silicon glass-fabrics adhesive tape 16 after another object fabrication. Moreover, although brush 2a is connected to the end of lead wire, the same effect is done so even if it connects with other motor inner conductors, for example, field coil.

[0019]

[Effect of the Invention] Since the leakage current circuit formed including lead wire, a grommet, and a machine frame is intercepted using the heat-resistant outstanding insulating member from a grommet when a motor carries out unusual operation accidentally as this invention was explained above, carbonization of a grommet does not progress but expansion of accident is prevented.

[0020] Moreover, since this silicon glass tube is inserted between lead wire and a grommet and the aforementioned leakage current circuit is intercepted, using a silicon glass tube as insulating member, the effect of expansion prevention of accident is strengthened further.

[0021] Furthermore, since this aramid paper is inserted between a grommet and a machine frame and the aforementioned leakage current circuit is intercepted, using aramid paper as insulating member, expansion prevention of accident can carry out more certainly.

[Translation done.]